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58982 7590 04/09/2008

CATERPILLAR/FINNEGAN, HENDERSON, L.L.P.
901 New York Avenue, NW
WASHINGTON, DC 20001-4413

EXAMINER

CRAIG, DWIN M

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 04/09/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/024,359

12/21/2001

Mohammed Asif Khan

8350.0243-00

6525

TITLE OF INVENTION: SYMBOLIC EVALUATION ENGINE FOR HIGH-PERFORMANCE SIMULATIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	07/09/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

58982 7590 04/09/2008

CATERPILLAR/FINNEGAN, HENDERSON, L.L.P.
901 New York Avenue, NW
WASHINGTON, DC 20001-4413

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/024,359 12/21/2001 Mohammed Asif Khan 8350.0243-00 6525

TITLE OF INVENTION: SYMBOLIC EVALUATION ENGINE FOR HIGH-PERFORMANCE SIMULATIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	07/09/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
CRAIG, DWIN M	2123	703-006000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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DATE MAILED: 04/09/2008

CATERPILLAR/FINNEGAN, HENDERSON, L.L.P.
901 New York Avenue, NW
WASHINGTON, DC 20001-4413

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 923 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 923 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/024,359

Applicant(s)

KHAN, MOHAMMED ASIF

Examiner

DWIN M. CRAIG

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 1/7/2008.
2. ☒ The allowed claim(s) is/are 1-60.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date ____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other ____. |

EXAMINER'S AMENDMENT

And

EXAMINER'S REASONS FOR ALLOWANCE

1. Claims 1-60 are allowed.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Roland McAndrews Reg. No. 41,450 on 3/28/2008.

The application has been amended as follows:

- 2.1 Claim 16 has been changed to;

--The method of claim 15, further including: solving each integral equation that is assigned an integral variable that appears linearly in the integral equation;

substituting the solved value into other equations; and if due to substitutions, one of the assigned variables is no longer in the equation, assigning another integral with a minimum integration rank to the one of the assigned variables.--

- 2.2 Claim 23 has been changed to;

--A computer-readable storage medium having stored thereon instructions which, when executed by a computer, cause the computer to perform a method of simulating a system, the method comprising:

defining equations modeling the system using terms having characteristics encapsulated within the terms;

symbolically processing the established equations for simplification, wherein the symbolic processing includes:

utilizing the Pantelides algorithm to reduce the established equations; and

eliminating an integral, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals;

processing system equations for efficient simulation, wherein processing the system equations includes:

processing a first set of equations including equations modeling the system and initial condition constraints; and

processing a second set of equations including equations modeling the system and numeric integration equations;

simulating the system using the processed equations; and

displaying results of the simulation. --

2.3 Claim 24 has been changed to;

--The computer-readable storage medium of claim 23, wherein defining equations further includes:

defining equations modeling the system using terms selected from one or more basic terms, composite terms, or collection terms.--

2.4 Claim 25 has been changed to;

--The computer-readable storage medium of claim 23, wherein the method further includes:

extending a library of terms by defining new term classes, wherein term classes define objects having characteristics encapsulated within the objects.--

2.5 Claim 26 has been changed to;

--The computer-readable storage medium of claim 23, wherein the method further includes:

defining a term group including one or more terms having related functionality;
evaluating each term within the term group upon an initial request for evaluation of any of the one or more terms within the term group;
storing the result of the evaluation for each of the one or more terms within the term group; and
recalling the stored value of the evaluated one or more terms from the term group upon a subsequent request for evaluation of the one or more terms, without performing the evaluation stage.--

2.6 Claim 27 has been changed to;

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--The computer-readable storage medium of claim 23, wherein utilizing the Pantelides algorithm includes reducing the established equations to a system of equations having a differential-algebraic system of equations index of at most one. --

2.7 Claim 28 has been changed to;

--The computer-readable storage medium of claim 27, wherein utilizing the Pantelides algorithm further includes:

assigning equations to variables that have non-zero partial derivatives; and
differentiating the remainder of the equations. --

2.8 Claim 29 has been changed to;

--The computer-readable storage medium of claim 27, wherein utilizing the Pantelides algorithm further includes:

approximating an algebraic derivative for those equations that cannot be symbolically differentiated. --

2.9 Claim 30 has been changed to;

-- The computer-readable storage medium of claim 27, wherein utilizing the Pantelides algorithm further includes:

symbolically integrating equations that cannot be assigned. --

2.10 Claim 31 has been changed to;

--The computer-readable storage medium of claim 27, wherein utilizing the Pantelides algorithm further includes:

differentiating equations that add output derivatives and integrating equations that add output integrals. --

2.11 Claim 32 has been changed to;

-- The computer-readable storage medium of claim 27, wherein eliminating an integral further includes:

eliminating an integral as each symbolically differentiated or integrated equation eliminates a numeric integration, such that the integral is converted to an algebraic variable by eliminating the derivative or integral relationship. --

2.12 Claim 33 has been changed to;

-- The computer-readable storage medium of claim [[1]] 23, wherein eliminating an integral further includes:

utilizing the preferred integration location rank, assigning integrals to equations; and eliminating the integration of assigned or solved integral variables. --

2.13 Claim 34 has been changed to;

The computer-readable storage medium of claim 23, wherein assigning a preferred integration location rank further includes:

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assigning, by a user, a preferred integration location to one or more integrals, the user assigned preferred integration location being given the highest available preferred integration location rank;

assigning, by a component developer, a preferred integration location rank, wherein the preferred integration location rank has a lower rank than the user defined preferred integration location rank; and

assigning all other integration locations a default lowest rank.

2.14 Claim 35 has been changed to;

-- The computer-readable storage medium of claim 34, wherein utilizing the preferred integration location ranks to assign integrals to equations further includes:

identifying integral variables that appear linearly and nonlinearly in the integral equations;

establishing a current preferred integration location rank at a default setting;

assigning each integral equation an integral variable that has a preferred integration location rank of less than the current preferred integration location rank and, if possible, appears linearly in the equation; and

repeating the previous three stages after increasing the current preferred integration location rank until a maximum preferred integration location rank has been exceeded. –

2.15 Claim 36 has been changed to;

--The computer-readable storage medium of claim 35, wherein the method further includes:

solving each integral equation that is assigned an integral variable that appears linearly in the integral equation;

substituting the solved value into other equations; and if due to substitutions, one of the assigned variables is no longer in the equation, assigning another integral with a minimum integration rank to the one of the assigned variables. --

2.16 Claim 37 has been changed to;

--The computer-readable storage medium of claim 23, wherein performing system processing includes:

establishing an initial condition system using the first set of equations; and

establishing a transient system using the second set of equations. --

2.17 Claim 38 has been changed to;

--The computer-readable storage medium of claim 23, wherein processing a first set of equations includes:

processing a first set of equations including equations modeling the system and user-defined and component-defined initial condition constraints. --

2.18 Claim 39 has been changed to;

--The computer-readable storage medium of claim 23, wherein performing system processing includes:

performing the system processing on the first set of equations and the second set of equations independently and in parallel. --

2.19 Claim 40 has been changed to;

--The computer-readable storage medium of claim 23, wherein processing system equations further includes:

replacing alias variables;
partitioning the equations into blocks;
tearing the blocks;
sorting the blocks; and
compressing equation terms. --

2.20 Claim 41 has been changed to;

--The storage computer-readable storage medium of claim 40, wherein tearing the block includes:

identifying block variables in the equations in the block in which the block variables appear linearly with constant coefficients;
solving nonlinear integration equations for their respective integrals;
determining the solvability of the nonlinear equations;

solving the nonlinear equations utilizing iterates and block variables solved from the linear equations;

solving the linear equations; and

scanning the solved variables for identification of variables that are independent and may be removed from the block. --

2.21 Claim 42 has been changed to;

--The computer-readable storage medium of claim 40, wherein block sorting the blocks further includes:

defining and identifying the blocks as static blocks, dynamic blocks, or output blocks;

removing the static blocks from a list of blocks; and

removing the output blocks from the list of blocks. --

2.22 Claim 44 has been changed to;

-- A computer-readable storage medium having instructions stored thereon which, when executed by a computer, cause the computer to perform a method of simulating a system, the method comprising:

symbolically processing a set of equations, including:

assigning a portion of the set of equations to variables that have non-zero partial derivatives;

differentiating the remainder of the set of equations;

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approximating an algebraic derivative for those equations that cannot be symbolically differentiated;

symbolically integrating equations that cannot be assigned;

differentiating equations that add output derivatives and integrating equations that add output integrals;

eliminating an integral as each symbolically differentiated or integrated equation eliminates a numeric integration, such that the integral is converted to an algebraic variable by eliminating the derivative or integral relationship, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals;

simulating the system based on the symbolically processed set of equations; and

communicating results of the simulation to an external device. --

2.23 Claim 48 has been changed to;

-- The method of claim 47, further including:

solving each integral equation that is assigned an integral variable that appears linearly in the integral equation;

substituting the solved value into other equations; and if due to substitutions, one of the assigned variables is no longer in the equation, assigning another integral with a minimum integration rank to the one of the assigned variables. --

2.24 Claim 49 has been changed to;

-- A computer-readable storage medium having instructions stored thereon which, when executed by a computer, cause the computer to perform a method of eliminating an integral in a Pantelides algorithm in an application that simulates a system, the method comprising:

 assigning a preferred integration location rank to one or more integrals;
 utilizing the preferred integration location rank, assigning integrals to equations defining the system;
 eliminating from the equations the integration of assigned or solved integral variables;
 simulating the system using the equations; and
 displaying results of the simulation. --

2.25 Claim 50 has been changed to;

-- The computer-readable storage medium of claim 49, wherein assigning a preferred integration location rank further includes:

 assigning, by a user, a preferred integration location to one or more integrals, the user assigned preferred integration location being given the highest available preferred integration location rank;

 assigning, by a component developer, a preferred integration location rank, wherein the preferred integration location rank has a lower rank than the user defined preferred integration location rank; and

 assigning all other integration locations a default lowest rank. --

2.26 Claim 51 has been changed to;

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-- The computer-readable storage medium of claim 50, wherein utilizing the preferred integration location ranks to assign integrals to equations further includes:

identifying integral variables that appear linearly and nonlinearly in the integral equations;

establishing a current preferred integration location rank at a default setting;

assigning each integral equation an integral variable that has a preferred integration location rank of less than the current preferred integration location rank and, if possible, appears linearly in the equation; and

repeating the previous three stages after increasing the current preferred integration location rank until a maximum preferred integration location rank has been exceeded. --

2.27 Claim 52 has been changed to;

The computer-readable storage medium of claim 51, wherein the method further includes:

solving each integral equation that is assigned an integral variable that appears linearly in the integral equation;

substituting the solved value into other equations; and if due to substitutions, one of the assigned variables is no longer in the equation, assigning another integral with a minimum integration rank to the one of the assigned variables. --

2.28 Claim 54 has been changed to;

-- A computer-readable storage medium having stored thereon instructions which, when executed by a computer, cause the computer to perform a method of simulating a system, the method comprising:

performing a tearing process on a set of equations modeling a system, including:
identifying block variables in the equations in a block in which the block variables appear linearly with constant coefficients;
solving nonlinear integration equations for their respective integrals;
solving the linear equations;
determining the solvability of the nonlinear equations;
solving the nonlinear equations utilizing iterates and block variables solved from the linear equations;
scanning for solved for variables for identification of variables that are independent and may be removed from the block;
simulating the system using the processed equations; and
displaying results of the simulation. --

Examiner's Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance:

While Cellier teaches a method of symbolically processing equations and Pantelides teaches utilizing a Pantelides algorithm however, **none of these references taken alone or in combination with the prior art disclose**, eliminating an integral, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals, specifically including:

(claim 1) "...eliminating an integral, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals...",

(claim 23) "...eliminating an integral, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals",

(claim 44) "...eliminating an integral as each symbolically differentiated or integrated equation eliminates a numeric integration, such that the integral is converted to an algebraic variable by eliminating the derivative or integral relationship, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals...",

(claim 45) "...assigning a preferred integration location rank to one or more integrals; utilizing the preferred integration rank, assigning integrals to equations modeling the system; eliminating from the equations the integration of assigned or solved integral variables...",

(claim 49) "...assigning a preferred integration location rank to one or more integrals, eliminating from the equations the integration of assigned or solved integral variables...",

(claim 53) "...identifying block variables in the equations in a block in which the block variables appear linearly with constant coefficients; scanning for solved variables for identification of variables that are independent and may be removed from the block...",

(claim 54) "...identifying block variables in the equations in a block in which the block variables appear linearly with constant coefficients; scanning for solved variables for identification of variables that are independent and may be removed from the block...",

(claim 55) "...symbolically processing the established equations for reducing the number of terms in the equations, wherein symbolic processing reduces the established equations by

eliminating an integral, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals...”,

(claim 58) “...symbolically processing the established equations for reducing the number of terms in the equations, wherein symbolic processing reduces the established equations by eliminating an integral, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals...”,

(claim 59) “...symbolically processing the established equations for reducing the number of terms in the equations, wherein symbolic processing reduces the established equations by eliminating an integral, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals...”,

In combination with the remaining elements and features of the claimed invention.

Further Applicant successfully argued in the 10/9/2007 responses on page 30 of those responses that, “Applicant noted that neither Cellier nor Pantelides, taken individually or in combination, disclose or suggest "eliminating an integral... wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals.” The combination of the expressly claimed limitations and further the persuasive arguments presented during prosecution of the instant case have been, in combination, persuasive and the Examiner withdraws all of the previously applied rejections to claims 1-60.

It is for these reasons that the Applicant’s invention defines over the prior art of record.

3.1 As regards dependent claims 2-22, 24-43, 46-48, 50-52, 56, 57 and 60 are allowed for at least the reason that they depend upon an allowed claim.

3.2 Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DWIN M. CRAIG whose telephone number is (571)272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dwin McTaggart Craig
AU 2123

/Paul L Rodriguez/
Supervisory Patent Examiner,
Art Unit 2123